

TNReady
Sample Items
English language arts

Passage #4
Grade 6-8

Goofs and Great Inventions

Lost Cities, Lost Treasure

- 1 In 1871, an adventurer named Heinrich Schliemann started digging in the ground of a Turkish city, seeking the lost land of Troy. Schliemann, a businessman and scholar, was born in Germany in 1822. As a young man he dreamed of discovering the treasures of the ancient world, and even made a plan for it when he was nine years old.
- 2 His youthful sense of adventure eventually brought him to California, where he made a fortune in the gold rush. With his profits, he began his second career in archaeology.
- 3 Archaeology was still a young science in the 1800s. In fact, it was hardly a science at all. The promise of treasure and adventure in foreign lands attracted people like Schliemann. Like a lot of treasure hunters, Schliemann was smart, curious—and hungry for gold or fame. On the other hand, he loved ancient cultures, especially Greek culture. He loved learning and traveling. By the end of his life, he spoke 13 languages, including his native German. He loved Greek history and culture so much that he and his wife Sophia named their children Agamemnon and Andromache.
- 4 There was another, less likeable side to Schliemann. He has been described as a trickster who didn't always tell the truth. He was known for changing or making up details in his stories of discovery. He wrote a thrilling account of his experience in the San Francisco fire of 1849—even though he was nowhere near San Francisco at the time. And as much as he loved antiquities and learning, his love of attention and money were equally strong. They may have been too strong in the end.
- 5 In 1868 he had been seeking the lost city of Troy for many years. He found out that a British archaeologist named Frank Calvert owned part of a site in Turkey. It was near the modern town of Canakkale. Calvert believed that ancient Troy was founded at this site. He did not have the funds to dig or discover for himself. Schliemann agreed to fund and share in the work.
- 6 Calvert was very different from Schliemann. He was self-taught, modest, and liked to keep his discoveries quiet. He was serious about protecting the artifacts he found. He did not have enough money of his own to carry out his work. He had to rely on Schliemann's funds. This proved disastrous for him, and perhaps even worse for the remains of Troy.
- 7 By 1871, Schliemann had started digging up Troy his way. He was convinced he knew exactly how far down to dig, and how to get there. He had workers open up huge trenches in the earth, shoveling out layers of debris and artifacts that had lain undisturbed for centuries. Although he and Calvert both discovered treasure, the damage done to the site was profound. Today, archaeologists believe that the historic Troy that the Greek poet Homer described was in a layer much higher up. We will never know for sure.
- 8 Schliemann's careless actions erased important clues to Troy's past. Schliemann took the credit for what was found, and Calvert's contribution was almost forgotten. Calvert's family is still fighting to give him full credit for finding ancient Troy. Schliemann is remembered not only as a great explorer but also for being dishonest. Yet both men discovered great things at the site: ancient axes, household items, and jewels. Together, they did prove there had been an ancient city called Troy. The gold and other precious items they found are now in the Pushkin Museum in Moscow, Russia. Was the find worth the damage it caused to the site?

**How a Melted Bar of
Chocolate Changed Our
Kitchens**

- 9 Percy Spencer never set out to help you cook your dinner in only 5 minutes. All he did was carry a bar of chocolate in his pocket onto the factory floor. What he discovered that day was more than how to get chocolate stains out of your clothes. He discovered a completely new way to cook.
- 10 The events leading up to the most powerful melted candy in the world gives us a clue to the kind of person Percy Spencer was. He was born in the town of Howland, Maine in 1894. As a boy, he liked to tinker and discover how things worked. His uncle was handy with machines, and taught Spencer a lot about them. When a log hauler broke down outside their house, the young boy had fun watching and helping while his uncle worked to fix the truck.
- 11 Percy went to work quite early to help support his family. By the time he was 16, he was working full-time in a machine shop. He volunteered to be one of three men who helped the machine shop convert to electrical power in 1910. He had no real training at the time, but he decided to try. That experience taught him everything he needed to be an electrician.

- 12 Imagine for a moment what that was like for young Percy Spencer. Today, every year, computers are becoming faster and smaller. Touch-screen technology is still very new. We have hardly begun to understand what else we can discover. Imagine you are Percy Spencer in the brand-new world of electrical engineering. So much to discover! And so many mistakes to make!
- 13 In everything he did from then on, Percy Spencer seemed to run toward discovery and take the chance of making mistakes. He joined the navy to become a telegraph operator. Once again, he did not know much about this type of work. He taught himself what he needed at night, while he was standing watch on the ship.
- 14 By the time he was in his early 20s, Percy Spencer had taken another big leap. He was only the fifth employee of the new company Raytheon. He continued inventing and learning. The company grew, and his knowledge grew with it. Soon he was an equal with the smartest and best educated people in the United States.
- 15 Before Spencer Percy's lucky microwave discovery, Raytheon was most famous for making a device that helped shrink down the radio to a modest size and cost. That helped put radios in many American households, making it one of the first devices for broad, shared communication. Raytheon also manufactured magnetic devices used for tracking moving vehicles and other moving objects on Earth or in space. One of Raytheon's experiments was the Magnetron. The Magnetron generated microwaves, which are exactly what they sound like: small waves that are shorter in length than a regular radio wave. Scientists at Raytheon discovered that the Magnetron gave off a lot of heat. No one made a connection between this high heat and any possibilities for progress until Percy Spencer.
- 16 Standing near the Magnetron one day while it was on, Spencer noticed that the bar of chocolate in his pocket melted. He had a moment of realization. He asked for popcorn kernels, and put them near the heat. Minutes later, the man we can thank for microwave popcorn had a discovery on his hands.
- 17 It took more than 20 years, a lot of patience, and many mistakes before Raytheon perfected a microwave oven that people could use and could afford. In 1967, the Amana Radarange made its debut. Movies on demand at home were still decades away, but at least now Americans were ready with the popcorn. All thanks to Percy Spencer and his mistaken snack.

In Praise of Careful Science

- 18 Don't be fooled: Accidents usually do not lead to great discoveries. Although it is fun to think about how a bump on the head from an apple changed our understanding of gravity, the reality is less fun. Most of the time, scientists work for decades and make very few mistakes. When they do, most mistakes cause problems, not progress.
- 19 Scientist John Denker says that many "big discoveries" were actually invented, step by step. Scientists made small discoveries over time. A lot of these small discoveries were predicted, and then proven, with no mistakes. Denker describes how magnetrons and radar were discovered. They were researched for years. The work was kept secret. The scientists worked to avoid mistakes. When they were announced, the public did not imagine the years that went into that work. Then, Percy Spencer accidentally discovered the magnetron's property for heating food. That one moment overshadowed many years of careful science.
- 20 It also took more than 20 years after the "melted chocolate moment" to bring a commercial microwave to the public. The equally important process after discovery is also ignored. During that long process after discovery, scientists need to test their ideas with care and make as few mistakes as possible. When Pierre and Marie Curie discovered radium, they spent years after the 1898 discovery studying it. They were still studying it when they shared the Nobel Prize for Science with Henri Becquerel in 1903.
- 21 As John Denker says, "I am reminded of the rock star who said it took him 15 years to become an overnight sensation."
- 22 It is too easy to say, "Without mistakes, no discoveries can be made." Most mistakes do not lead directly to discoveries. Thomas Edison said that inventing was 1 percent inspiration and 99 percent perspiration. The typical role of a mistake in science is not to lead to a brilliant invention, but to teach a scientist how to do better next time. As space physicist Carl Sagan once said, "Science is a self-correcting process."

A Series of Quotations about Error and Discovery

- 23 “We learn wisdom from failure much more than from success. We often discover what will do by finding out what will not do; and
probably he who never made a mistake never made a discovery.”—19th century Scottish author Samuel Smiles
- 24 “Error is a hardy plant; it flourisheth in every soil.”—19th century English writer Martin Farquhar Tupper
- 25 “Love truth, but pardon error.”—18th century author and philosopher Francois Marie Arouet Voltaire
- 26 “The aim of science is to seek the simplest explanations of complex facts. We are apt to fall into the error of thinking that the
facts are simple because simplicity is the goal of our quest. The guiding motto in the life of every natural philosopher should be, Seek
simplicity and distrust it.”—20th century philosopher Alfred North Whitehead

Sample Item: Long Extended Response

Writing Training Test Grades 6-8 #1

It's no secret that sometimes great discoveries come as a result of really big mistakes. But are they always worth the problems they cause? Sometimes the mistakes lead to greatness, and sometimes they lead to disaster. Are mistakes key to making discoveries?

Write an essay for your science class web site arguing whether or not mistakes are a key part of discovery. Your essay must be based on ideas, concepts, and information from the “Goofs and Great Inventions” passage set.

Manage your time carefully so you can

- plan your essay;
- write your essay; and
- revise and edit your essay.

Be sure to

- include a claim;
- address counterclaims;
- use evidence from multiple sources.

Do not over rely on one source. Type your answer in the space provided.

A screenshot of a rich text editor toolbar. It contains buttons for bold (B), italic (I), underline (U), strikethrough (I_x), bulleted list, numbered list, undo, redo, link, unlink, and a text color picker.